

U. S. ARMY ENGINEER DIVISION, NEW ENGLAND
CORPS OF ENGINEERS
424 TRAPELO ROAD
WALTHAM 54. MASS.

ADDRESS REPLY TO:
DIVISION ENGINEER

REFER TO FILE NO.

NEDGW

16 July 1963

SUBJECT: Design Memorandum for Bridgeport Harbor, Johnsons
River, Connecticut

TO: Chief of Engineers
ATTENTION: ENGCW-E
Washington 25, D. C.

1. Reference is made to letter of 8 November 1962, Subject: Work Allowances for Small Authorized Projects, which provided funds in the amount of \$10,000 for preconstruction planning including preparation of design memorandum, on Johnsons River, an independent unit of the Bridgeport Harbor, Connecticut navigation project.

2. In accordance with EM 1110-2-1150, Engineering and Design, Definite Project Studies, dated 15 January 1962, there are inclosed four (4) copies of the design memorandum on the subject project. The work to be undertaken involves dredging operation with no special design or excavation problems. The design memorandum is approved in accordance with paragraph 6(b) of the above referenced authority.

3. Planning on this project is about 95% complete. Formal assurances of local cooperation have been executed. Bids are scheduled to be received 30 July 1963 and a request for allotment of construction funds will be made based on the bids received.

1 Incl
Design Memo (in quad)

P. C. HYZER
Brigadier General, USA
Division Engineer

cc: Div Engr file
Mr. Leslie
Mr. Hill
Mr. Fogarty
Opers Div
Engr Div file
Program Develop Br
w/incl as

DESIGN MEMORANDUM
ON
JOHNSONS RIVER
BRIDGEPORT HARBOR, CONNECTICUT

U. S. ARMY ENGINEER DIVISION, NEW ENGLAND
CORPS OF ENGINEERS
WALTHAM 54, MASSACHUSETTS
July 1963

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U. S. ARMY ENGINEER DIVISION, NEW ENGLAND
CORPS OF ENGINEERS
424 Trapelo Road
Waltham, Massachusetts

NEDGW

12 July 1963

DESIGN MEMORANDUM
ON
JOHNSONS RIVER
BRIDGEPORT HARBOR, CONNECTICUT

PERTINENT DATA

1. A summary of physical features and costs of the existing project for Bridgeport Harbor, Connecticut follows:

<u>Features</u>	<u>Present Estimate (1963)</u>
Completed project modifications:	\$2,207,000
Uncompleted project modifications:	
<u>COMPLETED UNIT</u>	
<u>Main Harbor</u>	
Deepen main channel to 35 ft.	1,845,000 (1)
<u>UNCOMPLETED UNITS</u>	
<u>Black Rock Harbor</u>	
Dredge 6 ft. anchorage	462,000 (2)
Construct 2 breakwaters	853,000 (3)
<u>Johnsons River</u>	
Dredge 6 and 9 ft. anchorages	<u>80,000</u> (4)
Total Project Costs	\$5,447,000

- (1) Continuing project, initiated in FY 1961, work essentially complete. Includes preauthorization study costs of \$15,000.
- (2) Includes preauthorization study costs of \$4,000 and local cash contribution of \$302,000.
- (3) Includes preauthorization study costs of \$3,000 and local cash contribution of \$442,000. Planning presently underway.
- (4) Includes preauthorization study costs of \$1,000 and local cash contribution of \$29,000. Planning presently underway. To be funded from FY 1963 lump sum appropriation for small authorized projects.

PROJECT AUTHORIZATION

2. The uncompleted modification of the existing project for Bridgeport Harbor, Connecticut was authorized by the River and Harbor Act of 3 July 1958 and provided for deepening the main harbor channel to 35 feet; dredging 6- and 9-foot anchorages in Johnsons River; dredging 6-foot anchorages in Burr and Cedar Creeks; and constructing 2 breakwaters at the entrance to Black Rock Harbor. The modification was authorized subject to the conditions that local interests agree to: (a) Furnish without cost to the United States all lands, easements, rights-of way, and suitable spoil disposal areas necessary for construction and maintenance when and as required; (b) Hold and save the United States free from damages due to the construction and maintenance of the improvements, special note being taken of the existence of oyster beds which may be damaged; (c) Provide a suitable public landing for recreational craft for each of the small craft improvements and make all necessary berth alterations for the main channel improvement; (d) Contribute in cash toward the first cost as follows: 52 percent of the construction cost of the Black Rock Harbor breakwaters; 66 percent of the construction cost of the Burr and Cedar Creek anchorages; and 45 percent of the cost of the upper Johnsons River anchorage; (e) Improve and maintain the shoreline adjacent to the Burr and Cedar Creeks anchorages to make it suitable for recreational use; and provide further that improvement of any of the sites may be undertaken independently of the others whenever funds for that purpose are available and the prescribed local cooperation has been furnished.

3. The existing project for Bridgeport Harbor was authorized by River and Harbor Acts enacted between 1836 and 1958 and provides for the following:

<u>Features</u>	<u>Width</u>	<u>Dimensions</u>		<u>Depth (MLW)</u>
		<u>Length</u>		
<u>Main Harbor</u>				
East Breakwater	-	3.823	-	-
West Breakwater	-	2.110	-	-
Anchorage	23 acres			25'
Anchorage	29 acres			18'

Features

<u>Main Harbor (Cont'd)</u>	<u>Width</u>	<u>Length</u>	<u>Depth (MLW)</u>
Main channel	300'-600'	3.5 miles	35'
Turning basin	-	-	35'
Yellow Mill channel	150'-200'	1 mile	18'
Poquonock River channel	125'-200'	1.2 miles	18'
<u>Johnson River</u>			
Channel	200'	1 mile	15' & 9'
Upper anchorage	2 acres		6'
Lower anchorage	2.4 acres		9'
	0.6 acres		6'
<u>Black Rock Harbor</u>			
East breakwater	-	900'	-
West breakwater	-	650'	-
Anchorage	28 acres		
Fayerweather breakwaters (a)	-	2.100'	-

(a) The construction and maintenance of shore protection on Fayerweather Island, including a seawall connecting the northerly and southerly portions of the island.

4. The existing project for Bridgeport Harbor was about 74% complete at the end of FY 1963. Work remaining on the project consists of construction at Black Rock Harbor including Burr and Cedar Creeks, and at Johnsons River as provided for in the modification authorized by the Rivers & Harbor Act of 1958 and described in paragraph 2 above.

5. The improvement under consideration in this design memorandum provides for a 2-acre small craft anchorage with a depth of 6 feet in the upper Johnsons River; and a 2.4 acre small craft anchorage with a depth of 9 feet, and a 0.6 acre small craft anchorage with a depth of 6 feet in lower Johnsons River.

INVESTIGATIONS

6. Physical investigations carried out in support of the survey report as contained in House Document 136, 85th Congress, 1st Session, are as follows:

- a. Hydrographic surveys made in 1953, 1954 and 1955.
- b. Topographic surveys made in 1951.
- c. Probings made in 1955.

Subsequent to project authorization, data in survey report was supplemented by more detailed field surveys of the project area. These surveys consisted of soundings made in April 1963 to determine the depths within the project area, and probings and borings to determine the geological subsurface conditions were made in June 1963.

LOCAL COOPERATION

7. A conference was held in April 1963 with State and City officials relative to the views of local interests on the general plan of the proposed improvement and conditions prescribed in the assurances. Local interests were in concurrence with the proposed improvement. The State Water Resources Commission is acting as coordinator for executing the state assurances of local cooperation. The State of Connecticut and the City of Bridgeport will share equally in the required cash contribution, 45% of the construction cost of the upper Johnsons River anchorage. Assurances have been furnished by the City of Bridgeport and the State of Connecticut and a check covering the cash contribution of the City of Bridgeport has been received. A check from the State of Connecticut covering their share is presently being processed through fiscal channels. Spoil areas were not requested as the nature of the material to be dredged was considered to create a nuisance if disposed of on shore.

8. The names of the principal officers and representatives contacted during the preconstruction planning phase are listed below:

Mayor Samuel Tedesco, City Hall, Bridgeport, Conn.
Mr. William S. Wise, Director, Water Resource Commission,
Hartford, Conn.
Mr. Louis Petriel, Jr., East End Yacht Club, Bridgeport, Conn.
Mr. Charles E. Smith, City Engineer, Bridgeport, Conn.
Mr. G. Richard Johnson, Deputy Director, Public Works,
Bridgeport, Conn.

LOCATION AND TRIBUTARY AREA

9. Bridgeport Harbor is located on the north shore of Long Island Sound about 60 miles east of New York City and consists of two widely separated areas: the main harbor, serving the east and central portions of the city; and Black Rock Harbor, located about 2 miles westward, serving the western portion of the city. The main harbor consists of an outer harbor and an inner harbor extending inland about 1 mile in a northeasterly direction which is developed and includes several tributaries. The

combined waters of Johnsons River, which is 150 to 250 feet wide and navigable for about 1 mile, and of White Rock Creek and Lewis Gut enter at the upper eastern side of the outer harbor. A swing-type highway bridge crosses Johnsons River at its mouth.

10. The area tributary to Bridgeport Harbor includes about 500 square miles with a total population of between 400,000 and 500,000 of which about 40 percent are located in Bridgeport and the remainder in the surrounding 21 cities and towns. Industry in the area consists primarily of storage and distribution of petroleum products, and manufacturing, textile production, sheet brass, hardware, arms and ammunitions, electrical power and appliances, and steel and iron products. Important aircraft factories are located in Stratford. The city lies on U. S. Route No. 1 and on the main line of the New Haven Railroad between Boston and New York.

PROJECT PLAN

11. The project plan of improvement under consideration in this memorandum is basically the same as shown in the authorizing document HD 136/85/1 and provides (a) a 6-foot anchorage of about 2 acres at the end of the existing 9-foot Johnsons River channel, below Hollisters Dam, and (b) two anchorages of 6 and 9 foot depths and approximately 3 acres in size near the Miamogue Yacht Club. Overdepth dredging of one foot was recommended in the study.

12. Project costs determined were estimated on dredging quantities in terms of in-place measurement and provided for an allowance of 1 foot overdepth dredging. The project plan is shown on the attached map. The proposed work will be undertaken by bucket dredging with disposal in approved deep water dumping ground, in view of the objectionable nature of the material.

DEPARTURES FROM PROJECT DOCUMENT PLAN

13. Minor changes in the upper Johnsons River 6-foot anchorage were made to avoid hard material encountered above project depth. No change is contemplated in the one foot overdepth dredging.

COST ESTIMATES

12. The current estimate of cost is based on quantities determined from hydrographic surveys including probings made in April 1963 and barings made in June 1963 and includes an allowance of one foot of overdepth dredging to provide for inaccuracies in dredging operation. The amount of overdepth dredging is estimated a 5500 cubic yards. Latest hydrographic surveys show that removal of a small shoal between the 6 and 9 foot anchorage limit will constitute all the dredging necessary to provide the 9-foot anchorage area. The estimated cost of the dredging is based on use of a bucket dredge with disposal at the prescribed deep water dumping grounds and prices prevailing in June 1963. The work will require the removal of approximately 27,000 cubic yards of ordinary material.

13. Current Estimate of Costs (June 1963). -

Dredge 6 and 9-foot anchorages	
27,000 c.y. ordinary material @ 2.00 c.y.	\$54,000
Contingencies	6,000
Preauthorization Studies	1,000
Engineering and Design	7,000
Supervision and Administration	<u>12,000</u>
Total	\$80,000

14. Comparison of Costs. -

	Document Estimate (May 1958)	Latest Approved Estimate (July 1962)	Current Estimate (June 1963)
Dredging including. . .			
Contingencies	\$23,500	\$60,000	\$60,000
Preauthorization Studies.	-	1,000	1,000
Engineering and Design .	600	10,000	7,000
Supervision and Adminis- tration	<u>1,900</u>	<u>9,000</u>	<u>12,000</u>
Totals	\$26,000	\$80,000	\$80,000

15. Allocation of Costs. -

	Document Estimate (May 1958)	Latest Approved Estimate (July 1962)	Current Estimate (June 1963)
<u>Federal</u>			
Dredging including Contingencies	-	\$38,000	\$38,000
Preauthorization Studies	-	1,000	1,000
Engineering and Design	-	6,300	4,500
Supervision & Administration	-	5,700	7,500
Total Fed. (C. of E. Costs)	\$16,600(1)	\$51,000	\$51,000
Aids to Navigation	400	500	500
Totals	\$17,000	\$51,500	\$51,500
	Document Estimate (May 1958)	Latest Approved Estimate (July 1962)	Current Estimate (June 1963)
<u>Non-Federal</u>			
Dredging including Contingencies	-	\$22,000	\$22,000
Preauthorization Studies	-	0	0
Engineering and Design	-	3,700	2,500
Supervision & Administration	-	3,300	4,500
Sub-Total	\$ 9,400(1)	\$29,000	\$29,000
Public Landings	10,000(2)	11,000	11,000
Total Non-Federal Costs	\$19,400	\$40,000	\$40,000
<u>Total</u>			
Construction Cost (excl. public landings, preauthorization studies, and aids to navigation)	\$26,000	\$79,000	\$79,000

- (1) Not broken down in authorizing document
 (2) Self-liquidating

SCHEDULES FOR DESIGN AND CONSTRUCTION

16. Construction of the project requires the removal and disposal of about 27,000 cubic yards of ordinary material estimated to require approximately one month of dredging operation. Field investigations consisting of detailed topographic and hydrographic surveys including borings and probings are used as a basis for this design memorandum and the bidding documents.

17. The schedule for construction of the project follows:

- a. Issue plans and specifications. . . 12 July 1963
- b. Open bids 30 July 1963
- c. Award contract 15 August 1963
- d. Start construction 15 Sept. 1963
- e. Complete construction. 15 Oct. 1963

18. The construction of the improvement will be accomplished by contract work.

OPERATION AND MAINTENANCE

19. Maintenance of the project is the responsibility of the United States and will consist of periodic dredging to restore project depths within the limit of the authorized Federal project. The annual maintenance cost is estimated at \$500 based on an average annual deposition over the dredged area of 250 cubic yards and exclusive of maintenance to navigation aids.

BENEFITS

20. Benefits expected to accrue from the completed improvement at Johnsons River amount to \$4,900 and consist of the following:

Increased use of existing fleet	\$ 800
Transferred boats	100
Additional boats	<u>4000</u>
	\$4900

21. Annual charges computed in the authorizing document were based on a 50-year project life and an interest rate of 2 1/2 percent on both the Federal and Non-Federal investment.

Current annual charges estimated at \$3635 were computed at an interest rate of 2 7/8 percent on both Federal and Non-Federal investment over a 50-year project life.

Annual Charges

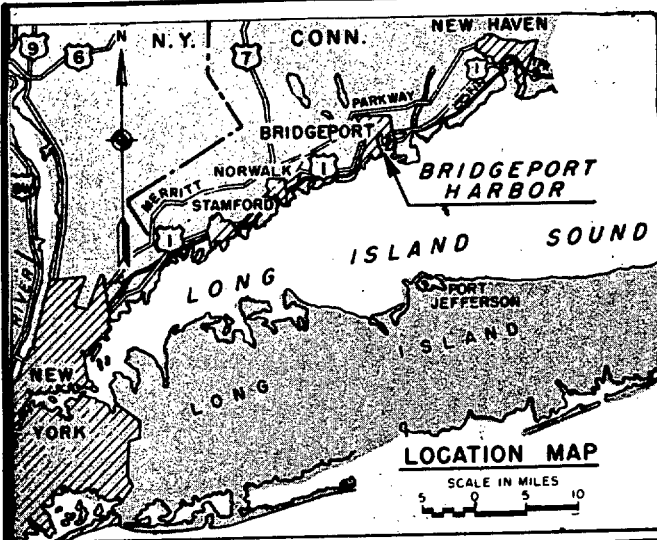
Investment @ 2 7/8% (50-year life)	\$3035
Maintenance	
Dredging	500
Aids	<u>100</u>
Total	\$3635

22. A comparison of estimated annual benefits of \$4900 to estimated annual charges of \$3635 yields a benefit-cost ratio of 1.3 to 1.

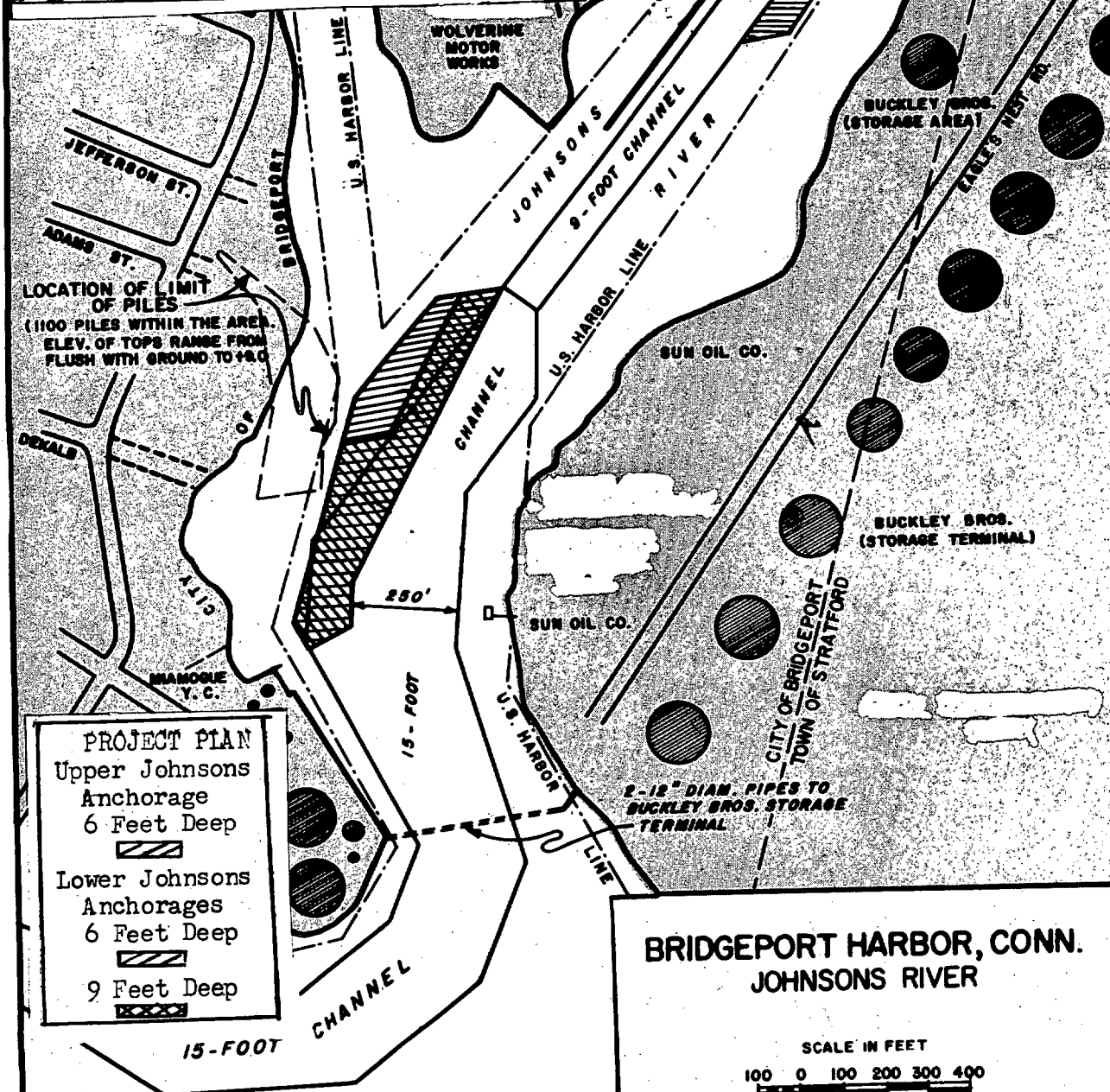
RECOMMENDATIONS

23. The plan of improvement proposed in this design memorandum provides for a 2-acre small craft anchorage with a depth of 6 feet in the upper Johnsons River, and a 2.4 acre small craft anchorage with a depth of 9 feet and a 0.6 acre small craft anchorage with a depth of 6 feet in lower Johnsons River. This project plan will adequately serve the needs of the present and prospective activity in the river and is adequately justified. It is recommended that the project be constructed as described under Project Plan above.

Incl: Map (1)



BRIDGEPORT



U.S. Army Engineer Division, New England
Corps of Engineers Waltham, Mass.